Control Sheet

Issue date	Revision number	Reason	Pages affected
08.15.2005	00	New release (FM4683)	All pages
11.10.2005	01	Corrections (FM4750)	All pages

CR-IR 357 Service Manual

Machine Description (MD)

1. Machine Overview

1.1 Features

■ Features of the Machine

- **The machine is network connectable via TCP/IP (100BASE-TX).**
- **A commonly available power source may be used to supply power to the machine.**
- **Improved facility in inserting/removing cassettes**

  The cassette inserting entrance is slantly positioned, to improve facility in inserting/removing the cassette.

- **Removal of IP static electricity**

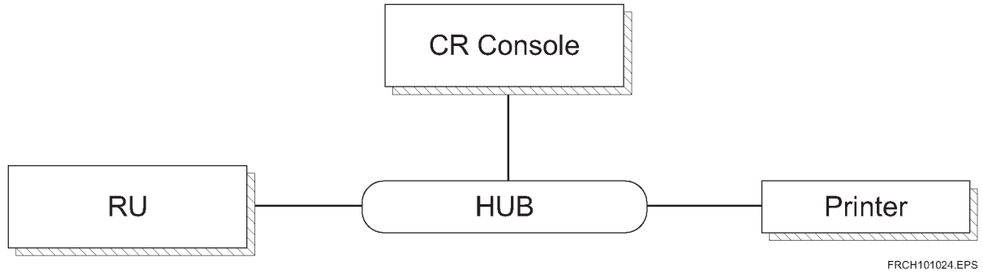
  IP static electricity is removed by the electrically-conductive ball bearing and bearing for each conveyance roller, as well as by the antistatic brush.

1.2 System Configuration

The machine (CR-IR357) may be connected to a network to achieve various system configurations.
Basic system configuration examples are described here.

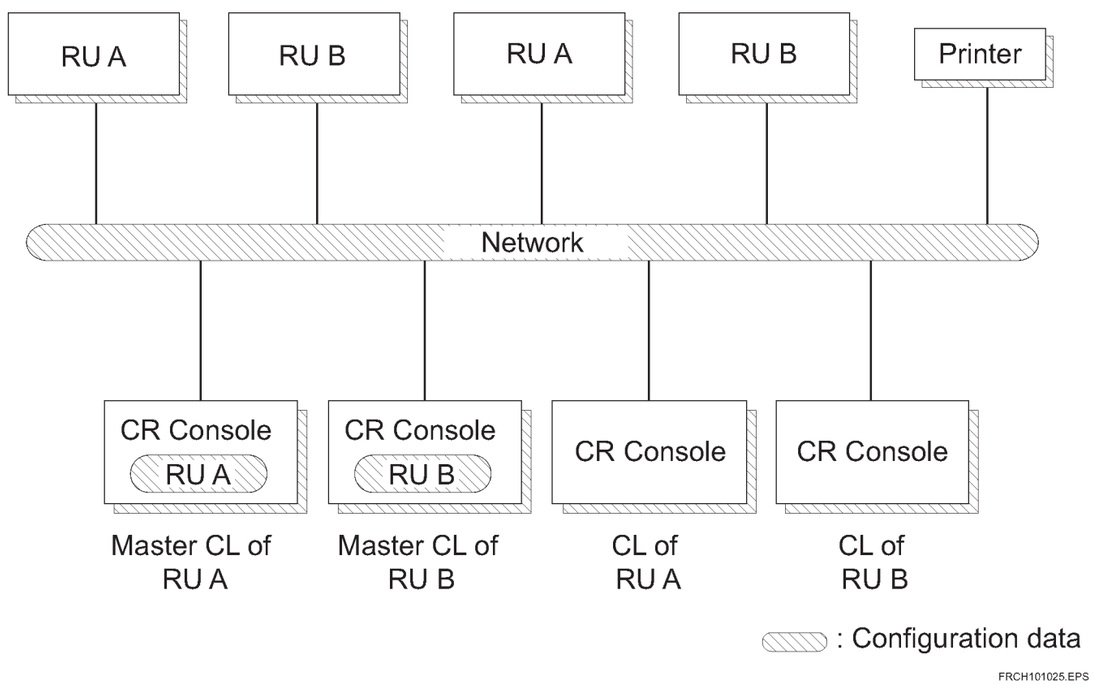
■ System Configuration Example (1)

The machine is connected to the CR Console via a network.
A connection with the CR Console is established over Ethernet (100Base-TX).



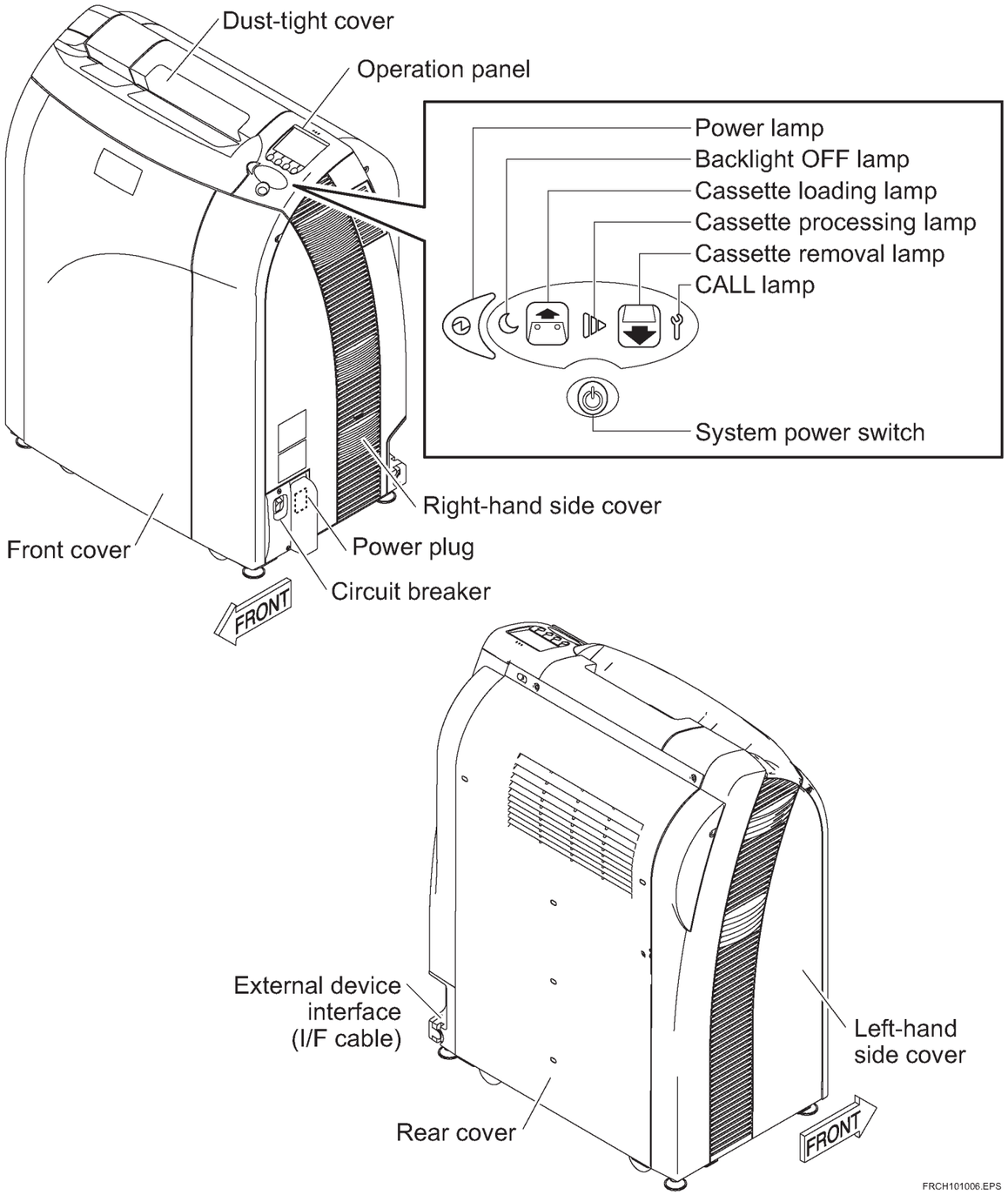
■ System Configuration Example (2)

The machine may be connected to a plurality of CR Console, including a single master CL.
The master CL contains the RU's configuration data and other information.



1.3 Overall Machine Configuration and Component Names

1.3.1 External View of Machine



1.3.2 Nomenclature and Functions

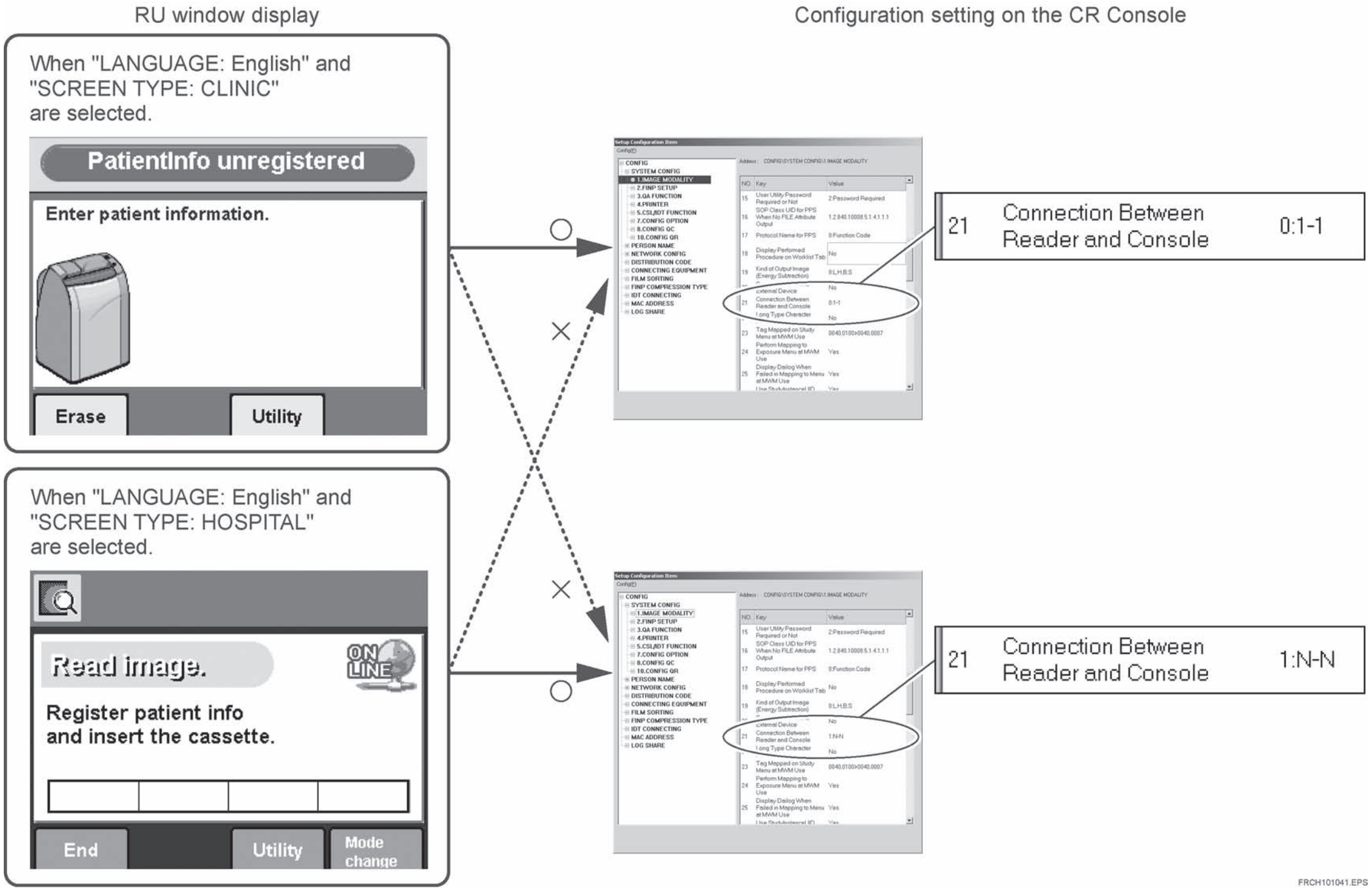
Name	Function
Operation Panel	Operation panel for the RU main body.
System power switch	Power switch for the RU. When this switch is pressed with the system power switch in the RU setting and the circuit breaker in the ON state, the RU is powered ON.
Power lamp	It is lit (in green) when the circuit breaker is pushed in the "I" position and power is turned ON. Since the circuit breaker remains in the ON state, the POWER lamp is always lit.
Cassette loading lamp	It is lit (in green) when the RU starts up normally, indicating that cassette loading is ready. While it is not lit, a cassette cannot be loaded.
Cassette processing lamp	It is lit (in green) while the cassette loaded into the RU is being processed. It blinks when the IP erasure is complete and goes out when the IP is ejected to the cassette.
Cassette removal lamp	It is lit (in blue) when removal of a processed cassette is ready.
Backlight OFF lamp	It blinks (in green) when the RU comes into the HIBERNATION mode.
CALL lamp	It is lit (in yellow) when an error of level 0 or level 1 occurs.
Circuit breaker	ON (1): Main power ON OFF (0): Main power OFF Keep ON for usual operation.

1.3.3 Operation Panel Display Screen Contents

The language to be displayed on the operation panel and the window vary as shown below depending on the “LANGUAGE” and “SCREEN TYPE” selected at the time of installation of RU software.

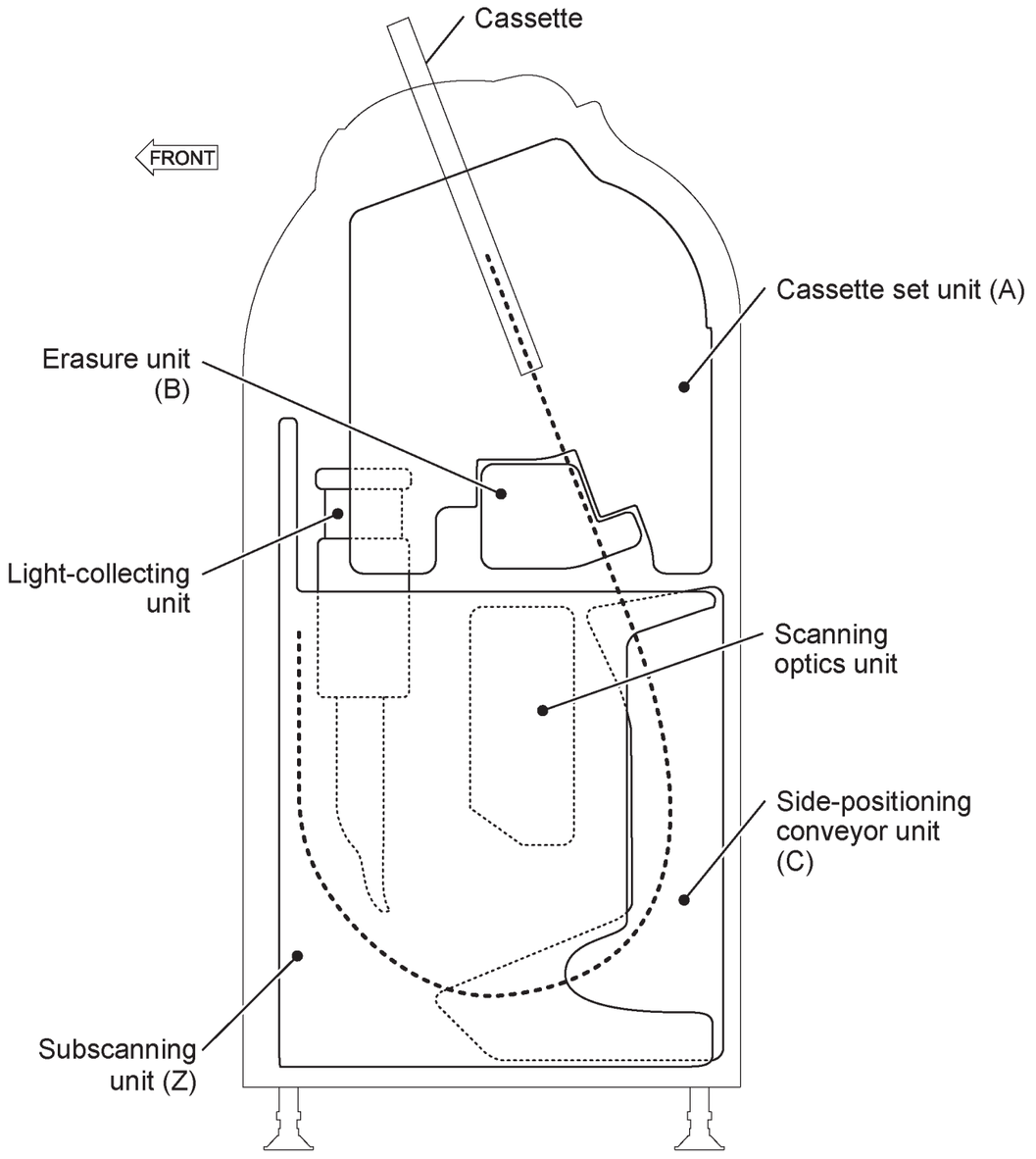
◆ *NOTE* ◆

The Configuration setting on the CR Console need be changed according to the “SCREEN TYPE” of the RU. The connection between the RU and the CR Console is not assured if different selection is made.
- When SCREEN TYPE is “CLINIC”, only “1:1 connection” is available.
- When SCREEN TYPE is “HOSPITAL”, only “N:N connection” is available.



1.4 Machine Components

1.4.1 Unit Locations



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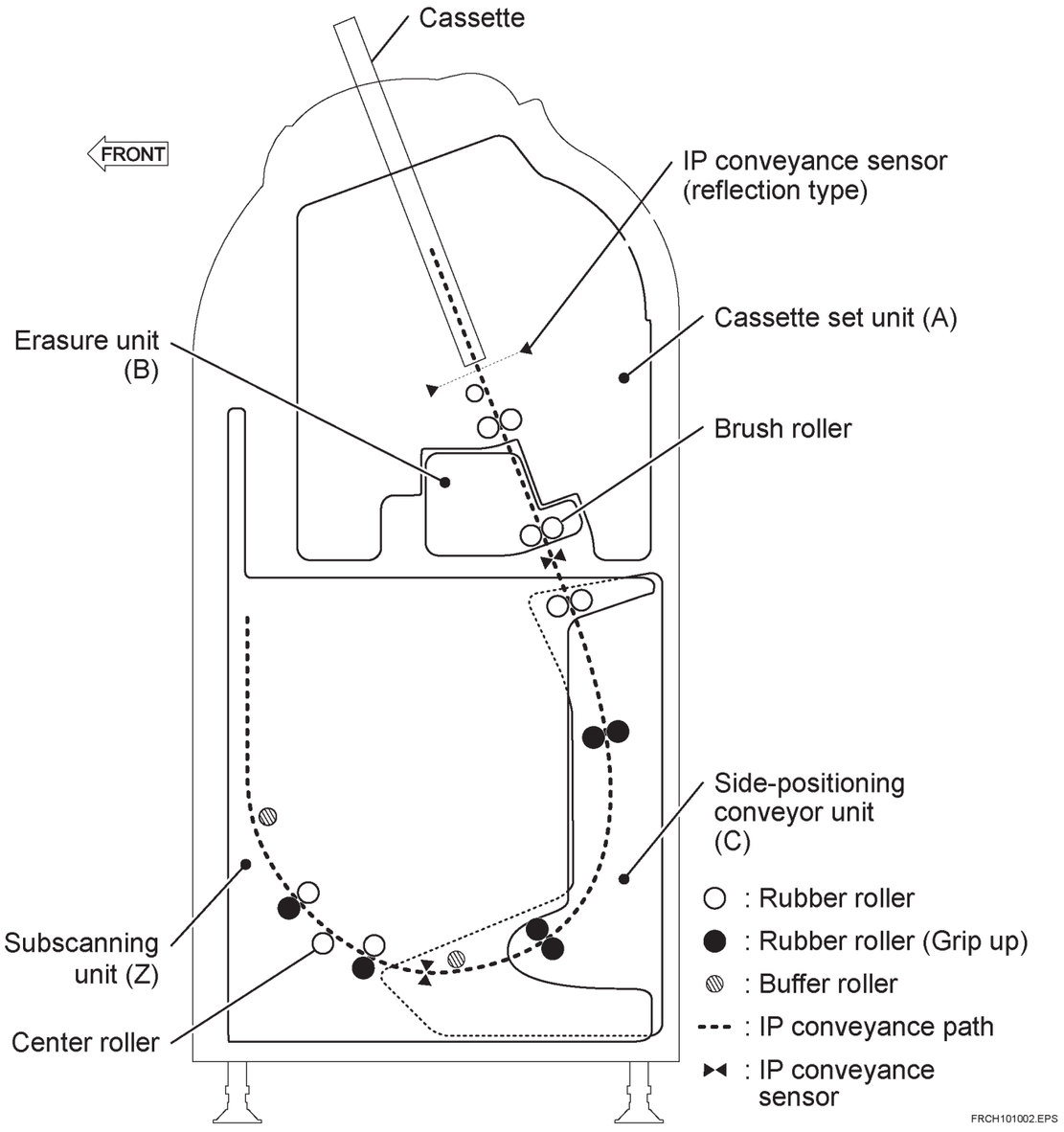
1.4.2 Roller Locations and Conveyance Paths



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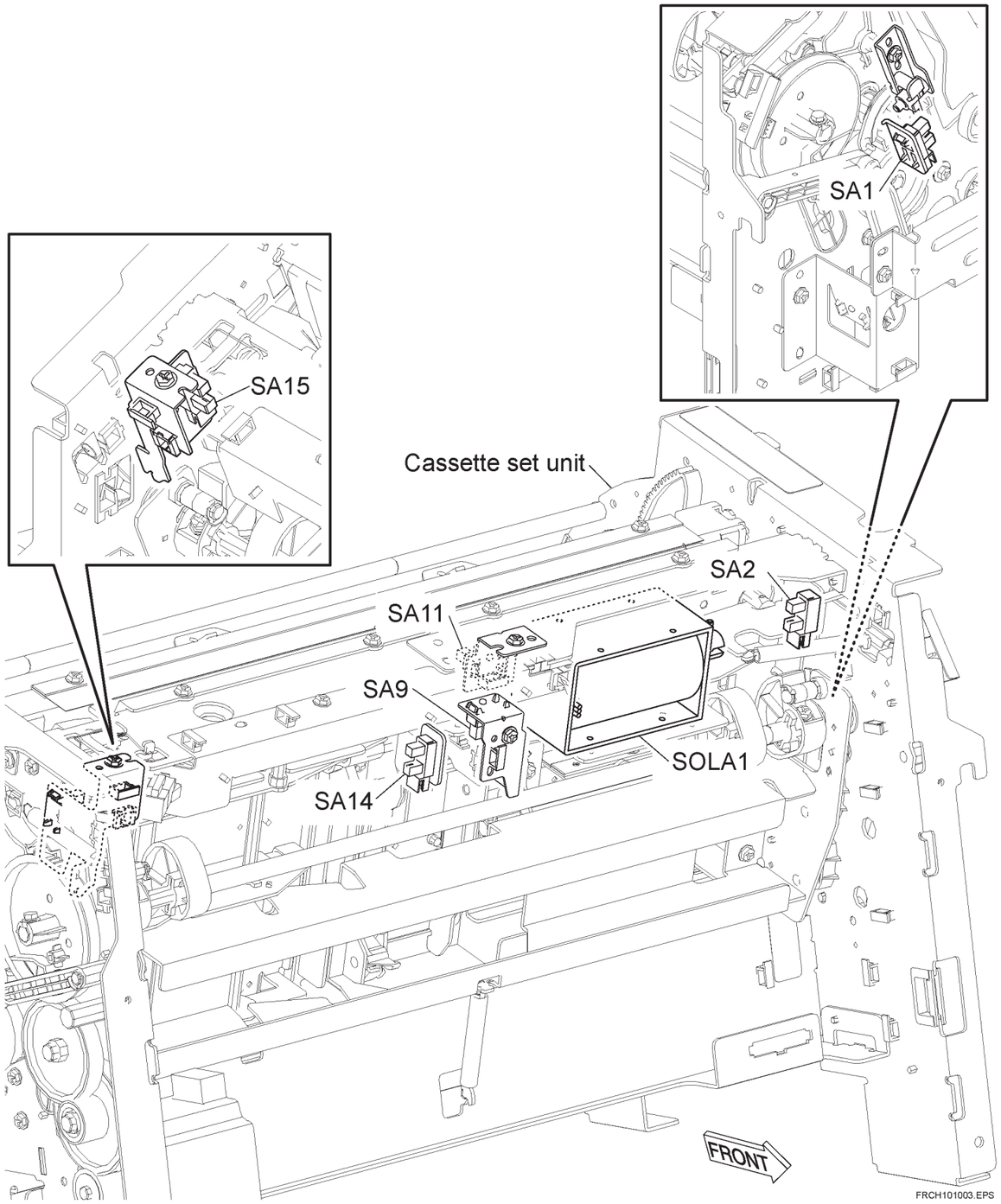
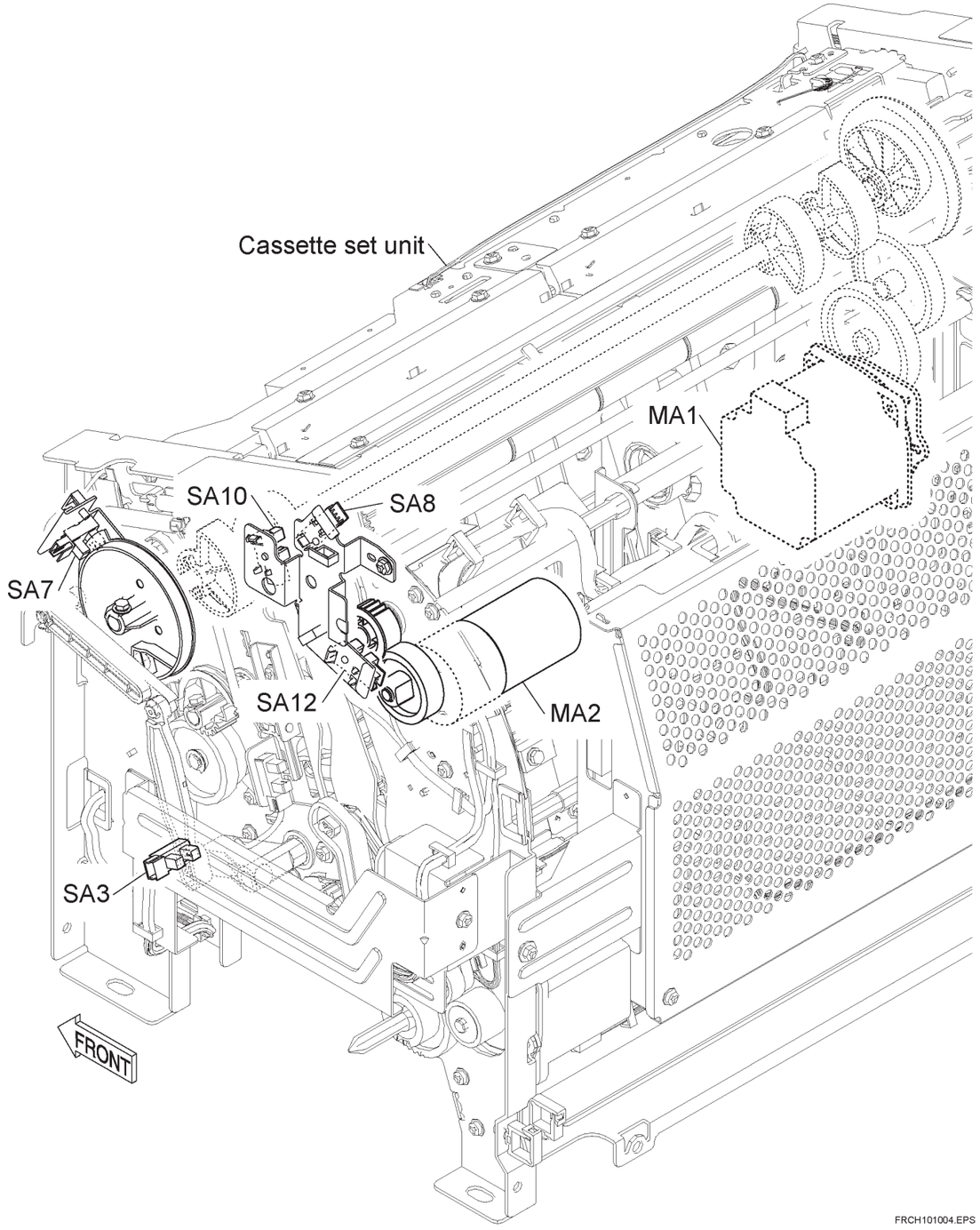
1.5 I/O Locations and Functional Descriptions

1.5.1 Cassette Set Unit - 1



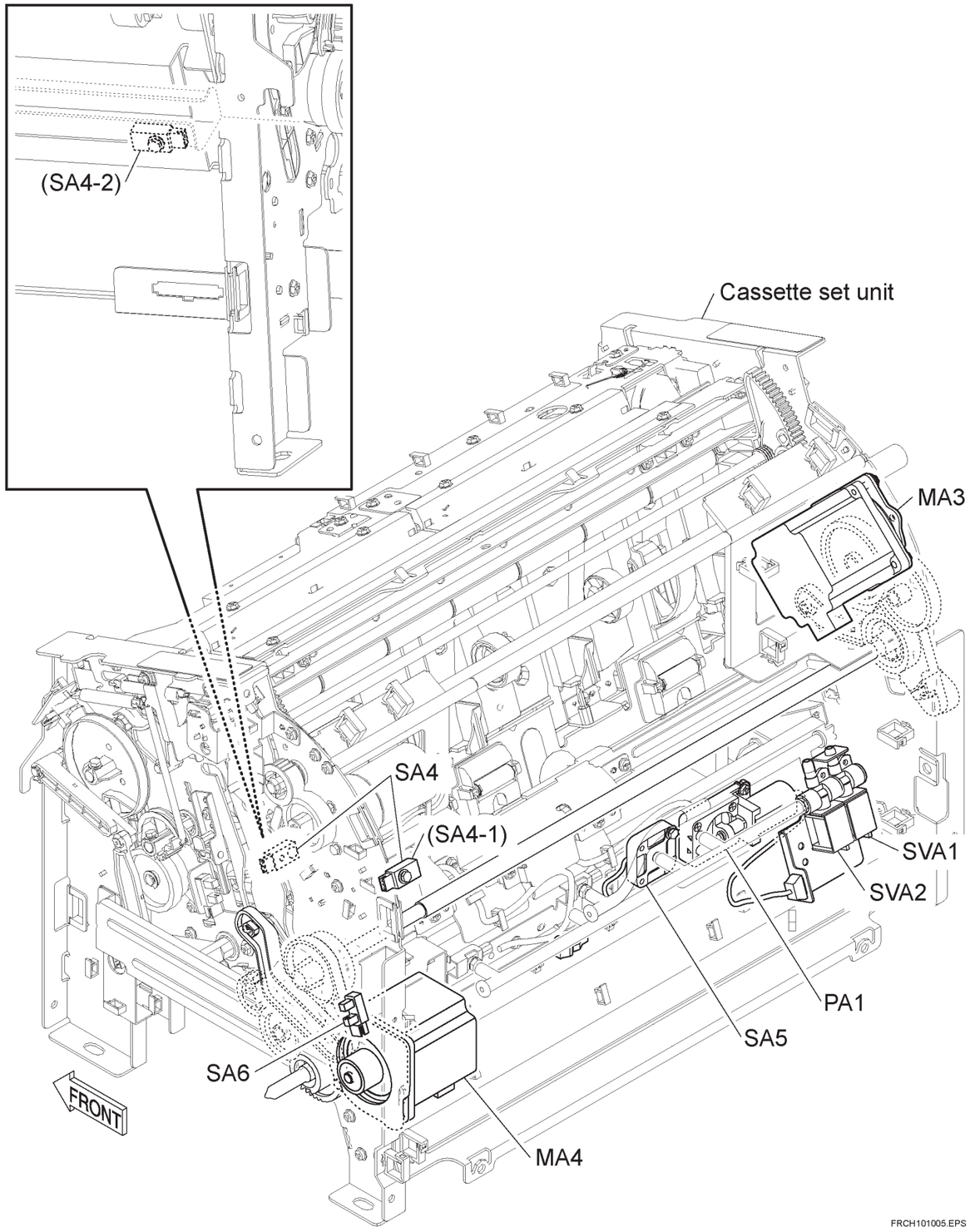
Symbol	Name	Type	Function	Reference
SA1	Cassette IN sensor	PI (5mm)	The sensor detects that the cassette is loaded, and is in CLOSE state when the cassette is loaded.	☞ {MD:5.2}
SA2	Cassette hold sensor	PI (5mm)	The sensor detects that the cassette is held, and is in CLOSE state when the cassette is held.	☞ {MD:5.2}
SA9	"15x30 cassette" identifying sensor	PI (5mm)	The sensor determines a 15x30 cassette. It is in OPEN state when the 15x30 cassette is inserted, and in CLOSE state when a cassette of another size is inserted.	☞ {MD:5.2}
SA11	Cassette ejection sensor	PI (5mm)	The sensor detects that the cassette is ejected, is in CLOSE state when the cassette is inserted, and in OPEN state when the cassette is ejected.	☞ {MD:5.2}
SA14	Cassette insertion error sensor	PI (5mm)	The sensor is in OPEN state when a small-size cassette is loaded. It is in CLOSE state together with SA15 when a large-size cassette is loaded. Wrong insertion of the cassette is indicated when the SA14 is in CLOSE and the SA15 is in OPEN.	☞ {MD:5.2}
SA15	Large cassette size sensor	PI (5mm)	The sensor detects that a large-size cassette is loaded, and is in CLOSE state when the large-size cassette is loaded.	☞ {MD:5.2}
SOLA1	Cassette hold pin solenoid	Power down solenoid	Holds/releases the cassette hold pin. The sensor is in OFF state when holding and in ON state when releasing.	☞ {MD:5.2}

1.5.2 Cassette Set Unit - 2



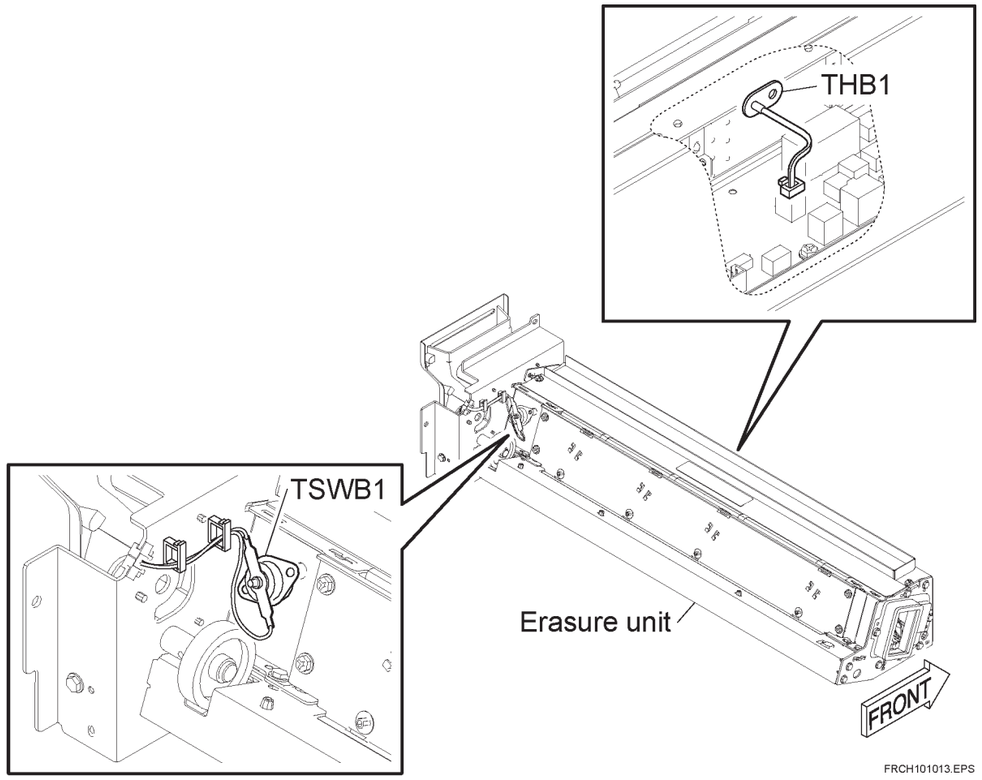
Symbol	Name	Type	Function	Reference
SA3	Debris fall prevention shutter sensor	PI (5mm)	The sensor detects whether the anti-foreign-matter shutter opens or closes, is in CLOSE state when the anti-foreign-matter shutter opens, and in OPEN state when the shutter closes.	☞ {MD:5.2}
SA7	Cassette cover opening mechanism HP sensor	PI (5mm)	The sensor detects that the IP retaining arm, the cassette cover-open mechanism and the anti-foreign-matter shutter are at the home position (HP), and is in CLOSE state when they are at the home position.	☞ {MD:5.2}
SA8	Cassette cover closing mechanism HP sensor	PI (5mm)	The sensor detects that the cover-close mechanism is at the home position, and is in CLOSE state when the mechanism is at the home position.	☞ {MD:5.2}
SA10	Cassette IP holding sensor	PI (5mm)	The sensor detects that the IP in the cassette is pressed, and is in OPEN state when the IP is pressed. It also detects whether a new cassette or an old cassette is inserted, is in OPEN state when the new cassette is inserted, and stays in CLOSE state when the old cassette is inserted.	☞ {MD:5.2}
SA12	Cassette cover CLOSE position sensor	PI (5mm)	The sensor detects that the cassette cover-close mechanism is at a close-cover position, and comes into CLOSE state.	☞ {MD:5.2}
MA1	Cassette cover opening mechanism driving motor	Two-phase pulse motor	Drives the IP retaining arm, the cassette cover-open mechanism and the anti-foreign-matter shutter.	☞ {MD:5.2}
MA2	Cassette cover closing mechanism driving motor	DC motor	Drives the cassette cover-close mechanism.	☞ {MD:5.2}

1.5.3 Cassette Set Unit - 3



Symbol	Name	Type	Function	Reference
SA4 (SA4-1, SA4-2)	IP dropping sensor	Separate transmitting type sensor	The sensor detects that the IP drops. An error is detected when the sensor is in CLOSE state with the IP having dropped before suction, or when it is in CLOSE state after the IP is returned to the cassette and before the cassette cover closes. SA4-1: Light emitting side SA4-2: Light receiving side	☞ {MD:5.2}
SA5	IP Suction sensor	Pressure sensor	The sensor detects that the IP is sucked, and is in Open state when the IP is sucked and in Close state when the IP leaks.	☞ {MD:5.2}
SA6	Suction arm HP sensor	PI (5mm)	The sensor detects that the removal arm is at the home position, and is in CLOSE state when the arm is at the home position.	☞ {MD:5.2}
MA3	Suction arm driving motor	Two-phase pulse motor	Drives the removal arm.	☞ {MD:5.2}
MA4	IP transport motor	Two-phase pulse motor	Conveys the IP.	☞ {MD:5.2}
PA1	IP suction pump	DC pump	Sucks the IP. It sucks the IP when turned ON.	☞ {MD:5.2}
SVA1	IP air-leak valve	Solenoid valve	Leaks the IP from the suction cup. It leaks the IP when turned ON.	☞ {MD:5.2}
SVA2	IP suction path changeover valve	Solenoid valve	Changes over the suction modes. ON: Two suction disks suck an IP other than a pantomographic IP. OFF: One suction disk sucks the pantomographic IP.	☞ {MD:5.2}

1.5.4 Erasure Unit



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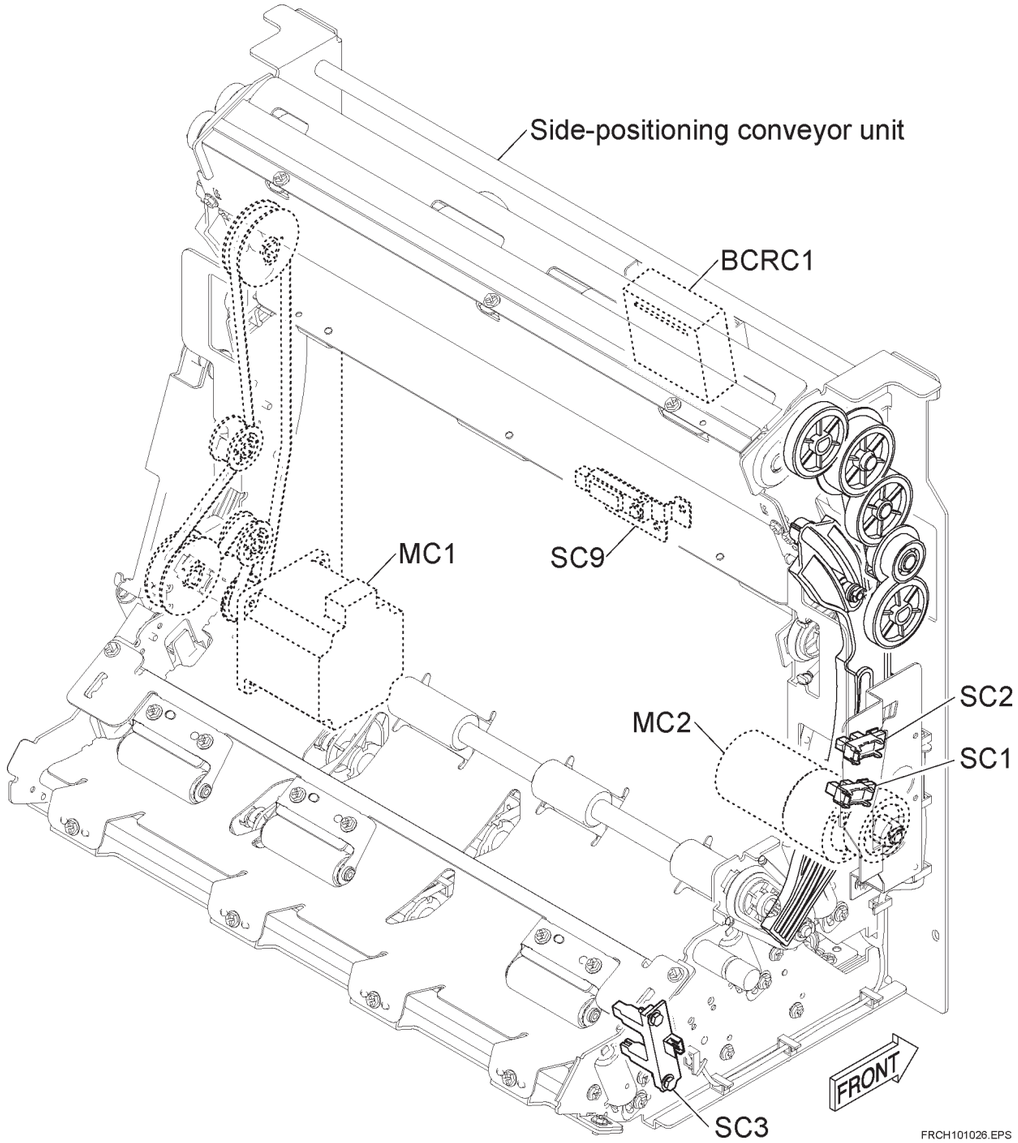
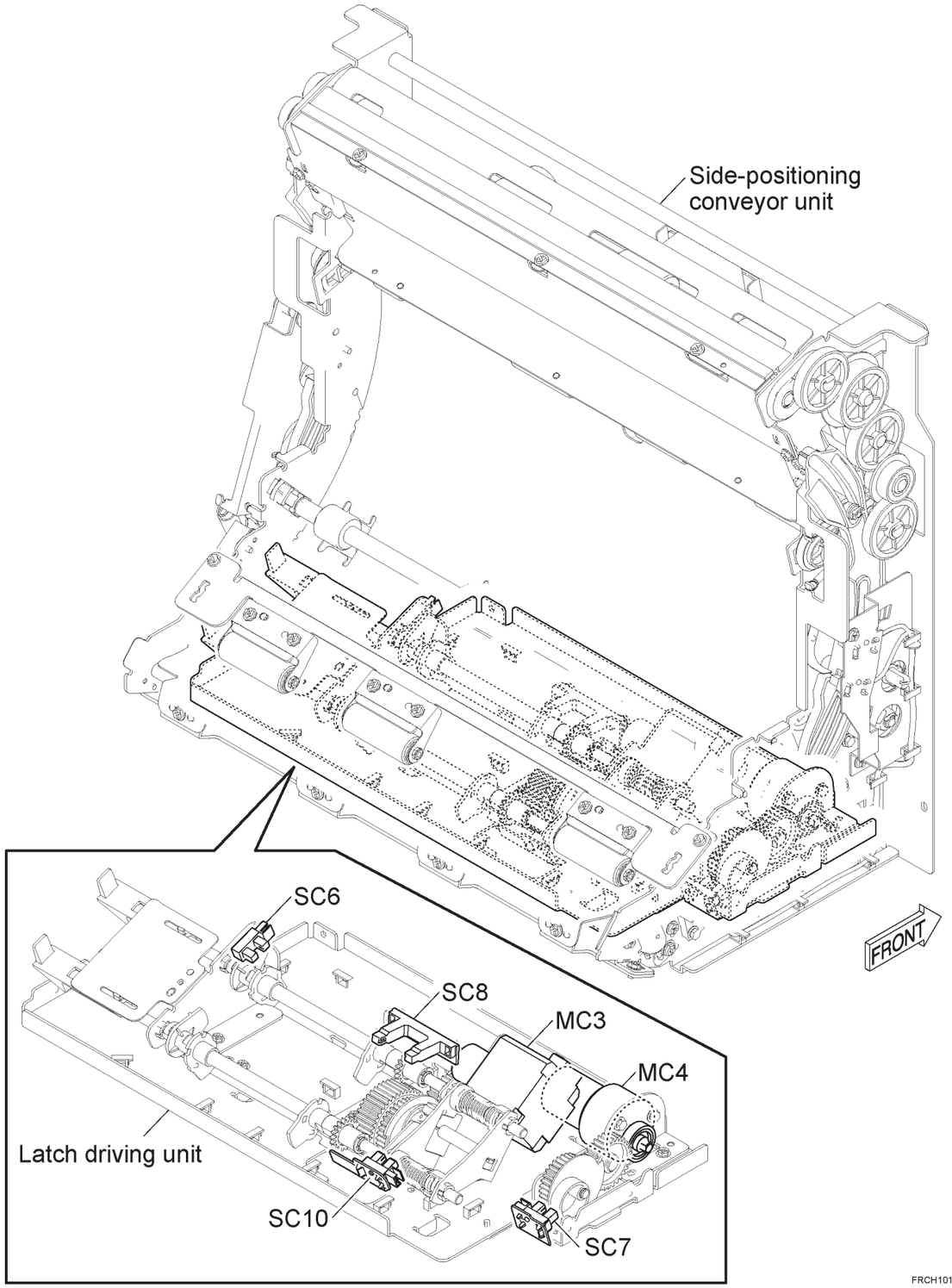
Symbol	Name	Type	Function	Reference
TSWB1	Thermal switch	Lamp temperature sensor	Safety switch against abnormal heat generation	☞ {MD:3.2.2}
THB1	Lamp temperature sensor	Thermistor	Detects the temperature in the lamp box of the erasure unit.	☞ {MD:3.2.2}

1.5.5 Side-Positioning Conveyor Unit - 1



Symbol	Name	Type	Function	Reference
SC1	Side-positioning grip HP sensor	PI (5mm)	The sensor detects the home position of the grip mechanism (grip down), and is in OPEN state when the mechanism is at the home position.	☞ {MD:5.4}
SC2	Side-positioning grip release position sensor	PI (5mm)	The sensor detects that the grip mechanism is at the grip release position, and is in OPEN state when the mechanism is at the grip release position.	☞ {MD:5.4}
SC3	IP sensor 1	PI (19mm)	Detects the IP position when side-positioning the IP that has been conveyed.	☞ {MD:5.4}
SC9	"15x31/24x30 IP width" identifying sensor	Reflecting-type photo-sensor	Detects the size of remaining IPs during bootup.	☞ {MD:5.4}
BCRC1	Barcode reader	Barcode reader	Reads the IP barcode.	☞ {MD:5.4}
MC1	Side-positioning IP transport motor	Two-phase pulse motor	Conveys the IP.	☞ {MD:5.4}
MC2	Side-positioning conveyor roller grip release motor	DC motor	Grips/releases the grip roller.	☞ {MD:5.4}

1.5.6 Side-Positioning Conveyor Unit - 2



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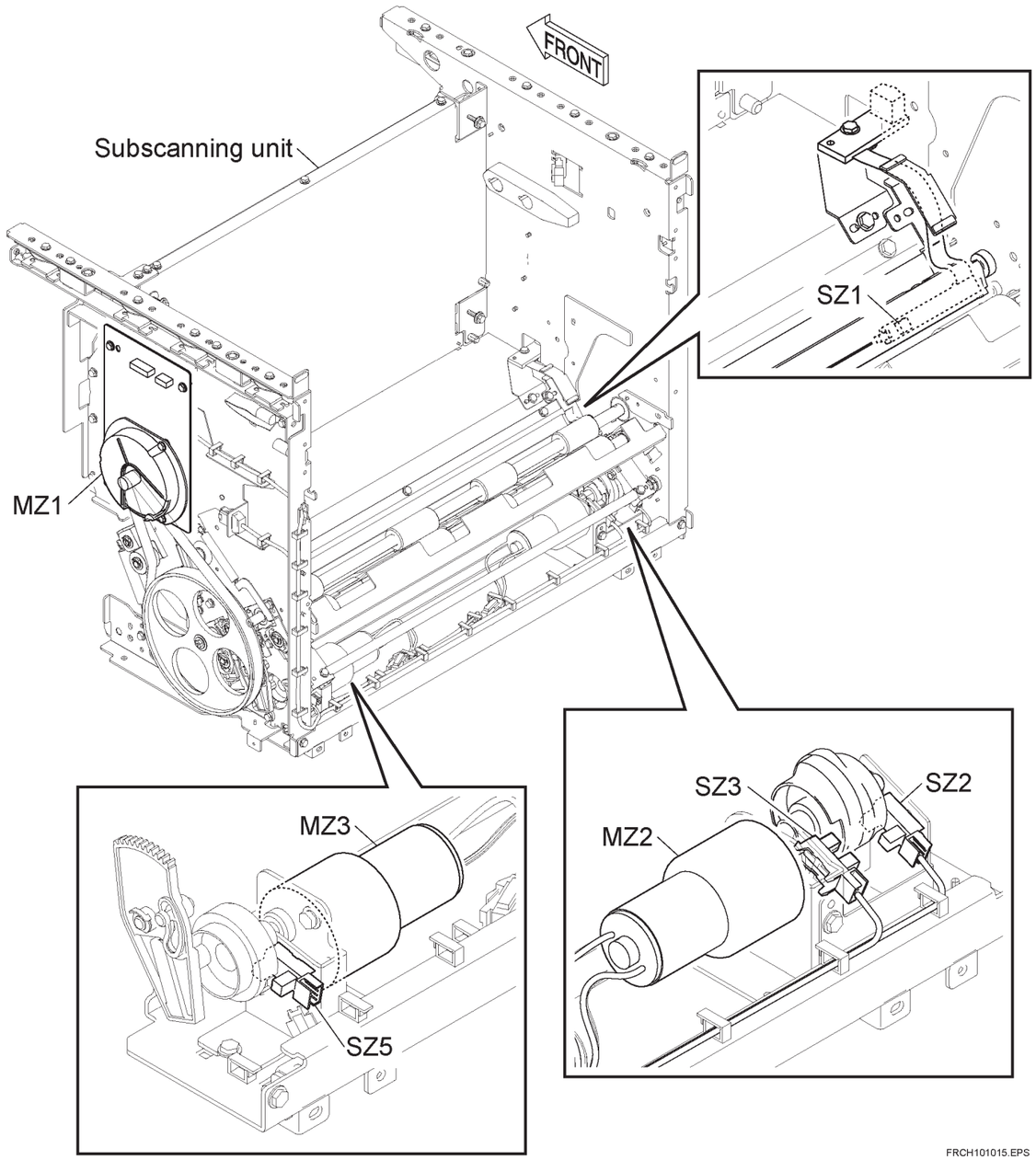
Symbol	Name	Type	Function	Reference
SC6	IP side-positioning HP sensor	PI (5mm)	Detects that the side-positioning mechanism is at the home position. The sensor is in CLOSE state when the mechanism is at the home position.	☞ {MD:5.4.1}
SC7	Side-positioning reference block HP sensor	PI (5mm)	Detects that the side-positioning reference frame is at the home position.	☞ {MD:5.4.2}
SC8	Side-positioning latch position sensor	PI (19mm)	Detects the side-positioning latch position for each IP size.	☞ {MD:5.4.1}
SC10	Side-positioning latch stroke sensor	PI (5mm)	Detects a pushed-in amount (stroke) of the side-positioning.	☞ {MD:5.4.3}
MC3	Side-positioning latch mechanism driving motor	Two-phase pulse motor	Drives the side-positioning latch mechanism. Protrudes the side-positioning latch in accordance with the IP size.	☞ {MD:5.4.1}
			Drives the side-positioning latch mechanism. Performs an IP side-positioning operation.	☞ {MD:5.4.3}
MC4	Side-positioning reference block driving motor	DC motor	Drives the side-positioning reference frame.	☞ {MD:5.4.2}

1.5.7 Subscanning Unit



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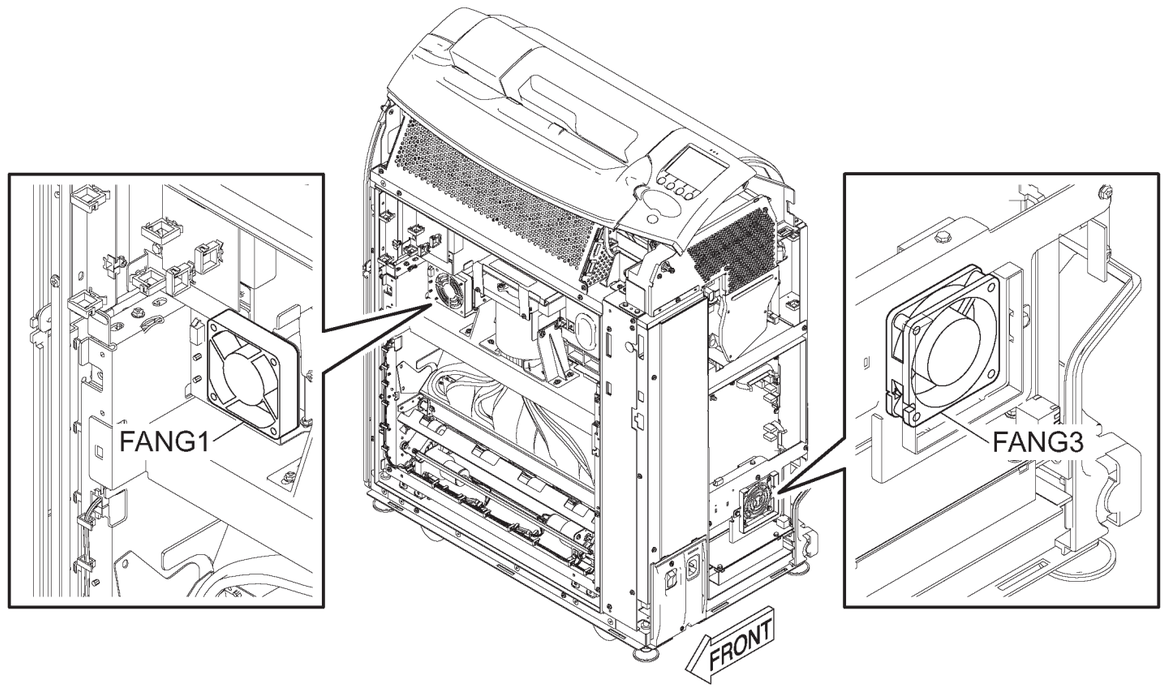
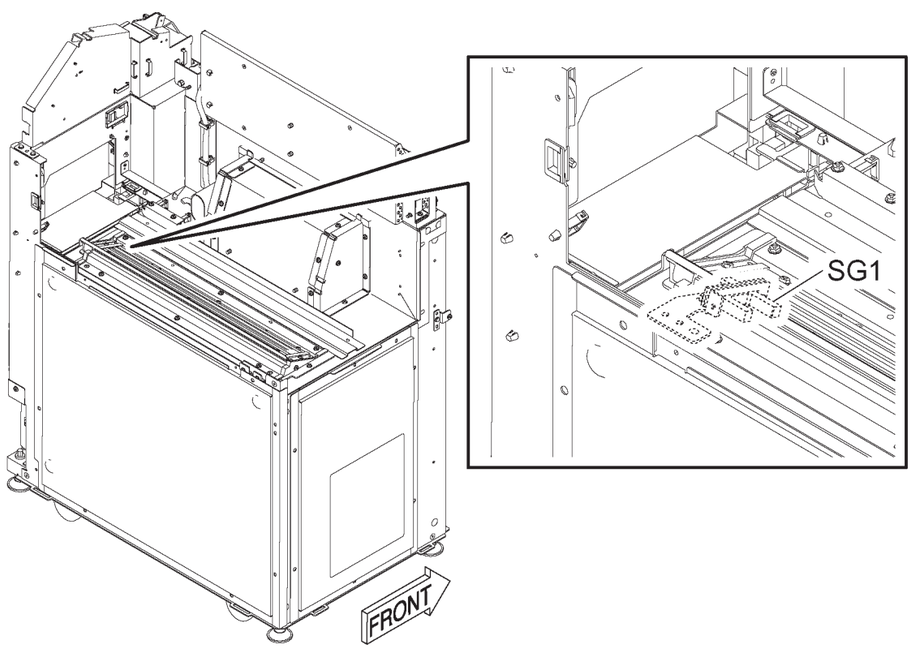
Symbol	Name	Type	Function	Reference
SZ1	IP leading-edge sensor	Laser light-receiving element	Detects the tip of the IP to be read.	-
SZ2	Driven-side grip roller release HP sensor	PI (5mm)	Detects the gripping state of the driven grip roller.	☞ {MD:5.5.1}
SZ3	Driving-side grip roller release HP sensor	PI (5mm)	Detects the gripping state of the driving grip roller.	☞ {MD:5.5.1}
SZ5	Dust removal HP sensor	PI (5mm)	The sensor detects that the light-collecting mirror dust removal mechanism is at the home position, and is in OPEN state when the mechanism is at the home position.	-
MZ1	Subscanning motor	FFM	Conveys the IP.	-
MZ2	Driven/driving grip roller driving motor	DC motor	Grips/releases the driving grip roller and the driven grip roller.	☞ {MD:5.5.1}
MZ3	Dust removal motor	DC motor	Drives the dust removal mechanism to remove dust from the light-collecting guide and the mirror.	-

1.5.8 Housing





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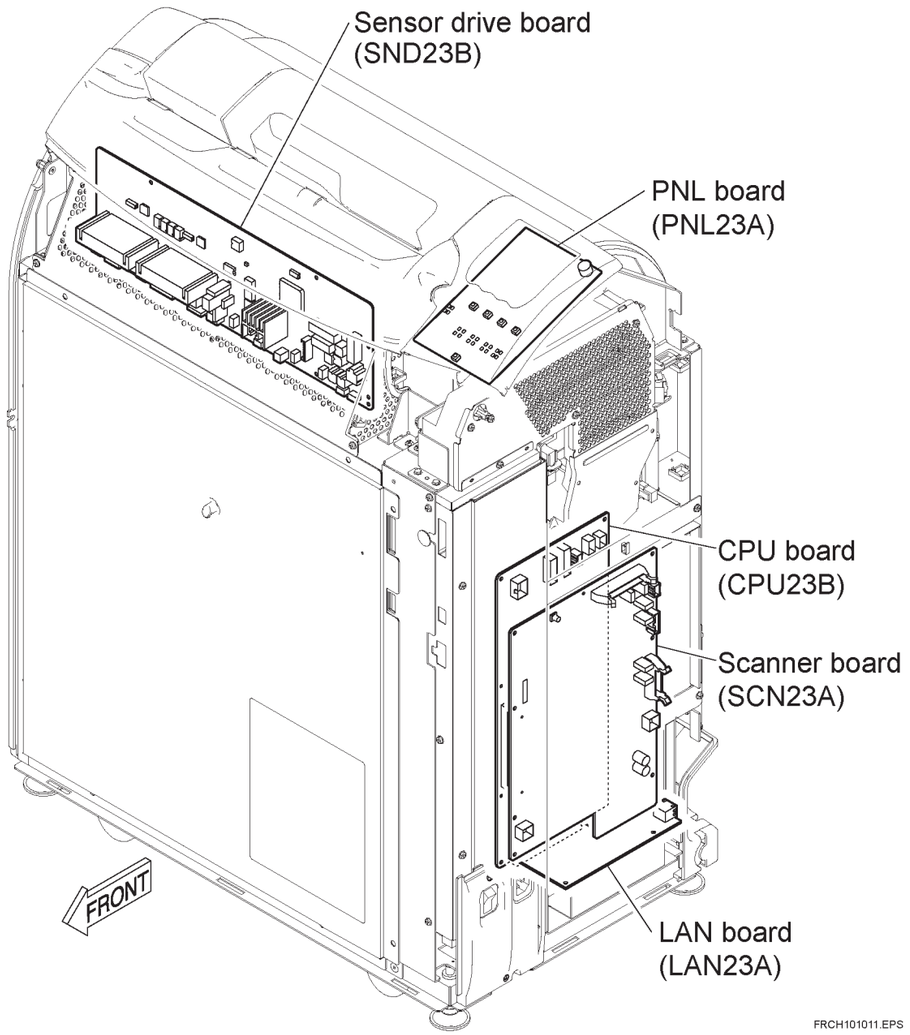
Symbol	Name	Type	Function	Reference
SG1	IP sensor 2	PI (19mm)	Detects that the IP being conveyed is present.	-
FANG1	Scanner unit cooling fan	DC fan	Stirs the air in the housing (scanner unit). (Can detect a rotation failure.)	-
FANG3	CPU board cooling fan	DC fan	Cools the control unit. (Cannot detect a rotation failure.)	-

1.6 Board Locations

1.6.1 Housing



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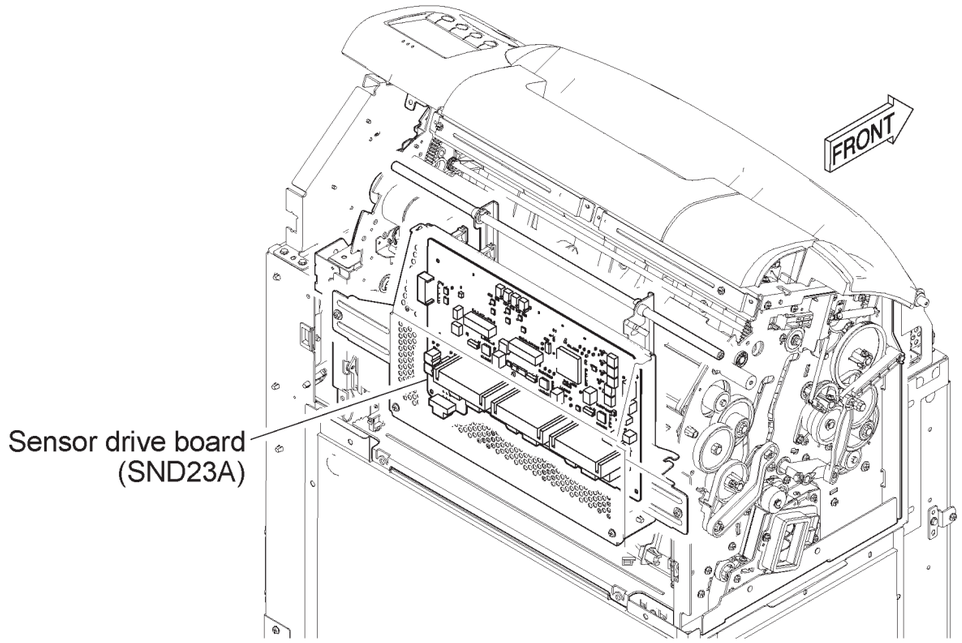
1.6.2 Cassette Set Unit



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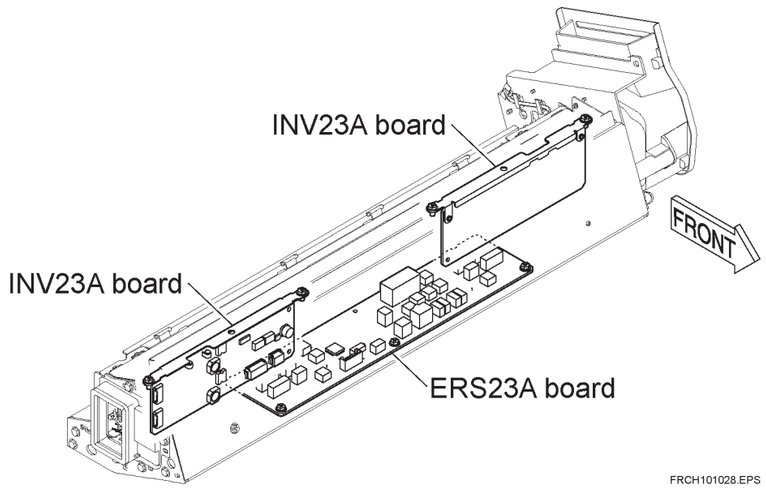
1.6.3 Erasure Unit



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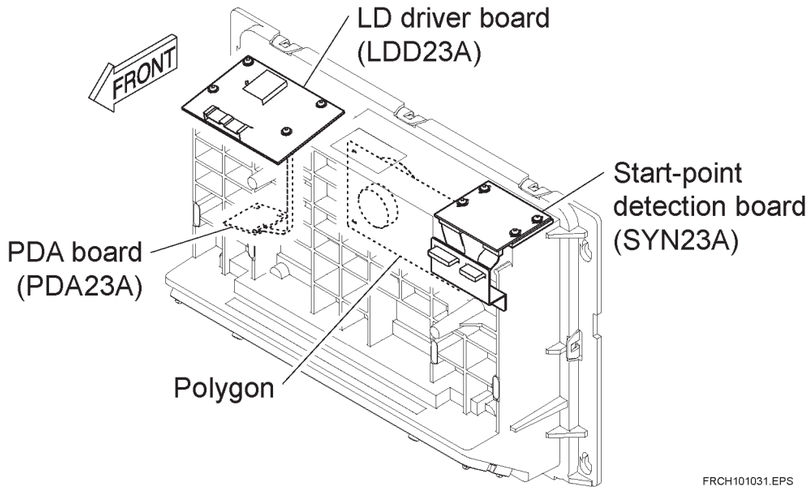
For the mounting position of the INV23A board, which is mounted on the ERS23A board, and the locations of the erasure lamps controlled by the INV23A board, see "3.2.3 Erasure Lamp and Board Configurations."

☞ **{MD:3.2.3_Erasure Lamp and Board Configurations}**

1.6.4 Scanning Optics Unit



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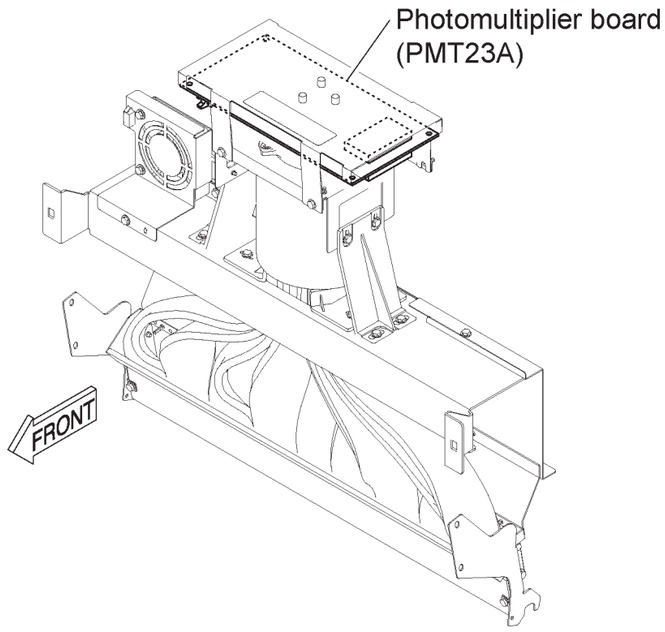
1.6.5 Light-Collecting Unit



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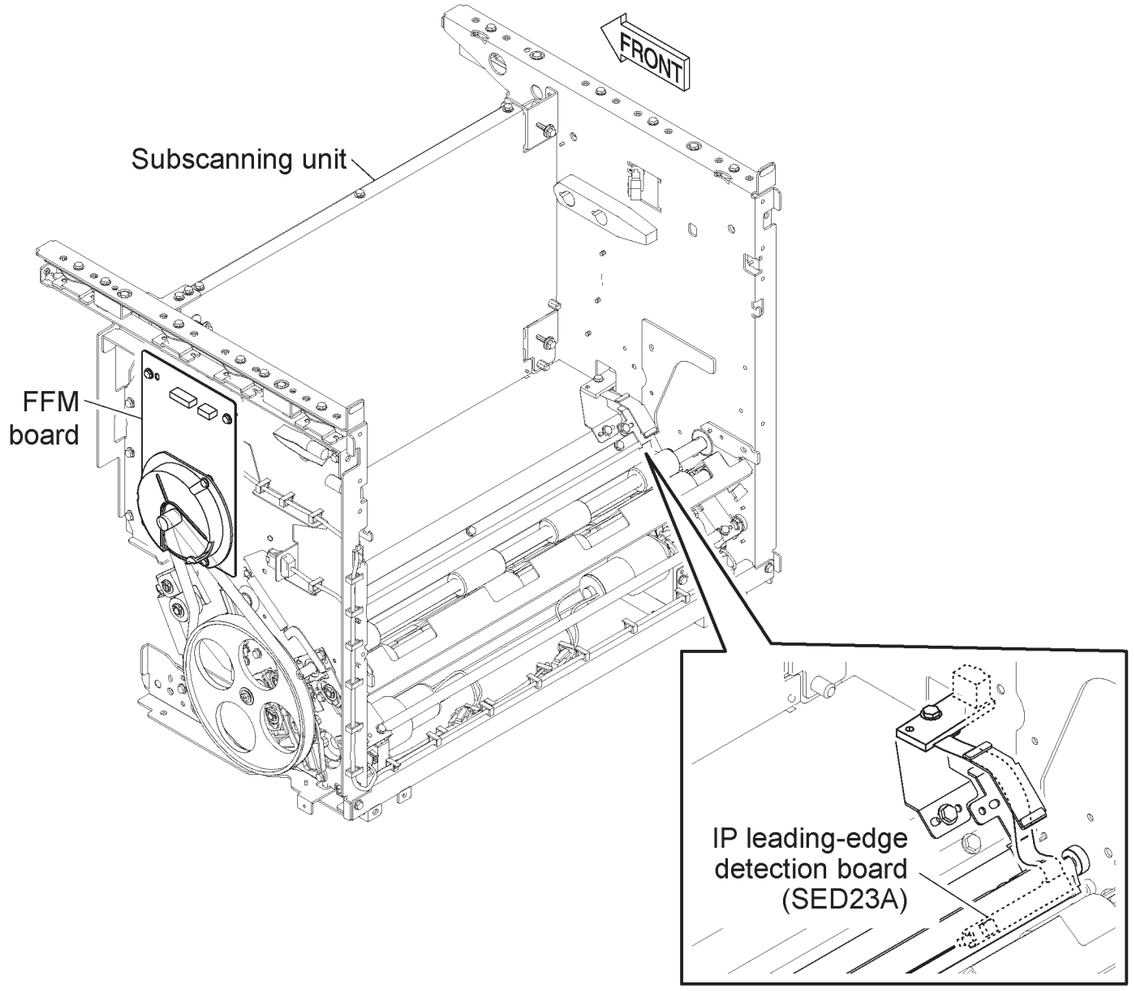
1.6.6 Subscanning Unit



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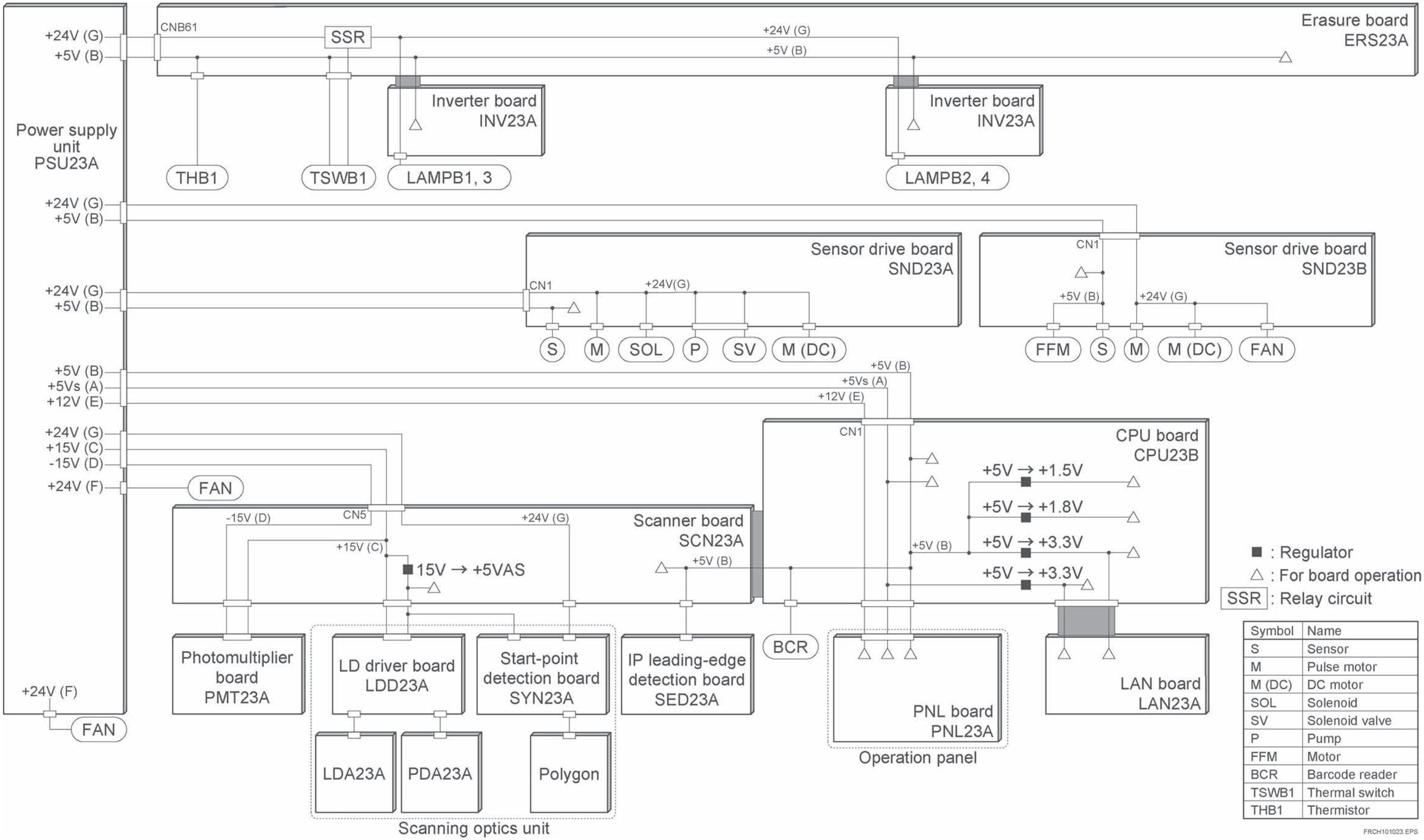
1.7 System Block Diagram

■ Power Supply System



Symbol	Name
S	Sensor
M	Pulse motor
M (DC)	DC motor
SOL	Solenoid
SV	Solenoid valve
P	Pump
FFM	Motor
BCR	Barcode reader
TSWB1	Thermal switch
THB1	Thermistor

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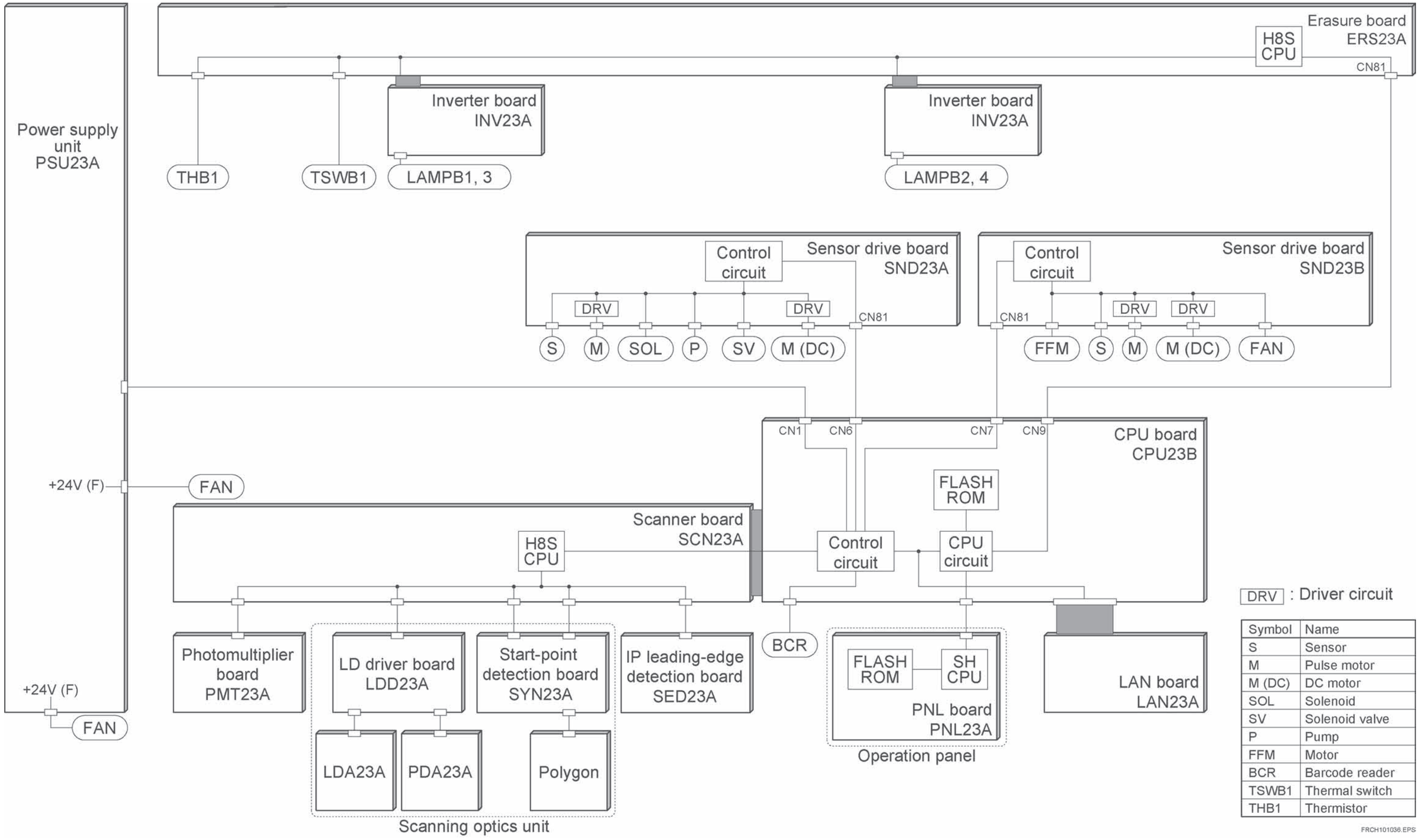
■ Signal System



DRV : Driver circuit

Symbol	Name
S	Sensor
M	Pulse motor
M (DC)	DC motor
SOL	Solenoid
SV	Solenoid valve
P	Pump
FFM	Motor
BCR	Barcode reader
TSWB1	Thermal switch
THB1	Thermistor

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